



Geotechnical & Construction Materials  
Engineering, Testing, & Inspection  
Environmental Services

Offices throughout the state of Florida

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April 14, 2025

Mr. Edwin Muller  
4211 N. FED., LLC  
6001 Broken Sound Parkway NW  
Boca Raton, Florida 33487

Subject: Report of Exfiltration Test  
**Federal Highway Multi Family**  
4211 N. Federal Highway  
Pompano Beach, Florida

Dear Mr. Muller:

Nutting Engineers of Florida, Inc. performed two exfiltration tests for the proposed drainage improvements at the above referenced location. This report presents a brief description of the field procedures, and the results of the exfiltration tests.

Two exfiltration tests were performed to a depth of six feet below existing grade in accordance with South Florida Water Management District (SFWMD) criteria for 'Usual Open-Hole' conditions.

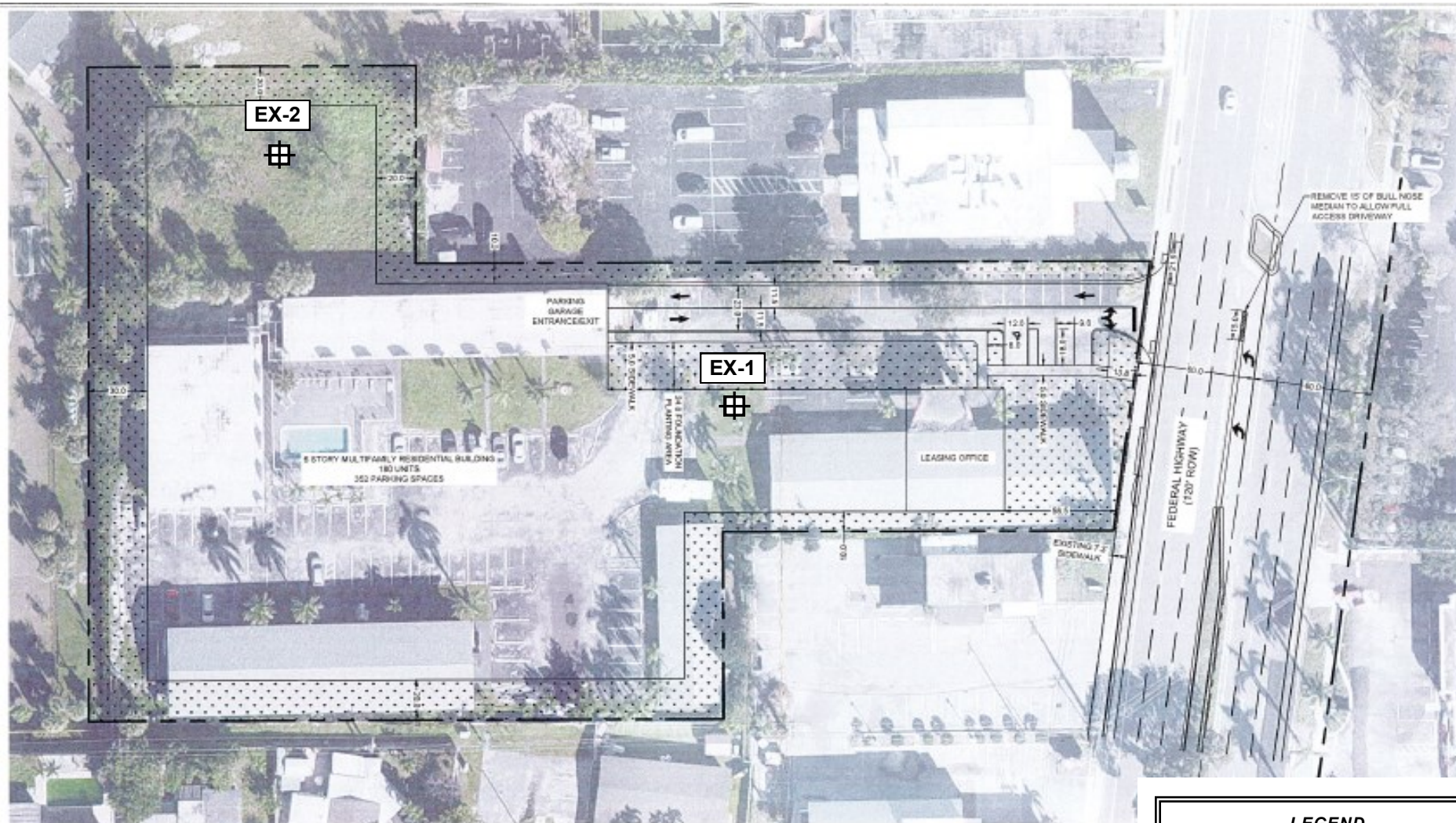
Prior to starting the test, a 6-inch diameter hole was augered to the test depth to determine the depth to groundwater and to examine subgrade soils. After establishing the above parameters, the hole was stabilized by a full-length perforated PVC pipe in accordance with South Florida Water Management District specifications. Water was then pumped into the hole maintaining a constant water level at the ground surface. The stabilized flow rates were recorded in one-minute intervals for a total of 10 minutes.

The exfiltration tests revealed the hydraulic conductivity ('K'-value) of the soils ranged from  $1.26 \times 10^{-3}$  to  $8.74 \times 10^{-4}$  cubic feet per second per square foot per foot of head. Soil descriptions and flow rates for the tests are shown on the attached exfiltration summary sheets. We note that the water table was below a depth of six feet at the time of the test. This testing was performed to determine the hydraulic conductivity value only. Soil information shall not be used for other purposes.

We appreciate the opportunity to provide these services for you. Should you have any questions, or if we can be of further assistance, please feel free to contact us.

Respectfully Submitted:  
**NUTTING ENGINEERS OF FLORIDA, INC.**

Christopher E. Gworek, P.E. #69947  
Senior Engineer



## EXFILTRATION TEST



4211 N FED, LLC  
**Federal Highway Mult Family**  
4211 N. Federal Highway  
Pompano Beach, Florida

### APPROXIMATE TEST LOCATION PLAN

GEOTECHNICAL EXPLORATION  
— *Not to Scale* —

FIG. 1

## Report of Exfiltration Test

Client:	4211 N. FED, LLC	Order No	21144.1
Project:	Federal Highway Multi Family	Report No	1
Location:	4211 N. Federal Highway	Date:	4/7/25
	Pompano Beach, Florida		
Test:	Usual Open Hole Exfiltration Test		
Surface Elevation:	Approx. @ Road Crown	Water table from ground surface:	>6'
Casing Diameter:	6"		
Tube Depth:	6'		

Hydraulic Conductivity (K) =  $1.26 \times 10^{-3}$  cfs/ft<sup>2</sup>ft.head

EXFIL NO. 1		One Minute Increment	Pump Rate in Gal/Min
Sample Location: <u>Approx. as located on Test Location Plan.</u>		1	18.0
		2	18.0
		3	17.0
		4	16.5
		5	16.5
		6	16.0
		7	16.0
		8	16.0
		9	16.0
		10	16.0

Material:	0-2'	Gray ton brown fine SAND
	2'-4'	Lt. tan fine SAND
	4'-6'	Brown fine SAND

## Report of Exfiltration Test

Client:	4211 N. FED, LLC	Order No	21144.1
Project:	Federal Highway Multi Family	Report No	2
Location:	4211 N. Federal Highway	Date:	4/7/25
	Pompano Beach, Florida		
Test:	Usual Open Hole Exfiltration Test		
Surface Elevation:	Approx. @ Road Crown	Water table from ground surface:	>6'
Casing Diameter:	6"		
Tube Depth:	6'		

Hydraulic Conductivity (K) =  $8.74 \times 10^{-4}$  cfs/ft<sup>2</sup>ft.head

EXFIL NO. 2		One Minute Increment	Pump Rate in Gal/Min
Sample Location: <u>Approx. as located on Test Location Plan.</u>  Material:      0-2'              Lt. gray to brown fine SAND 2'-3.5'            Lt. tan fine SAND 3.5'-5'            Dk. Reddish brown fine SAND 5'-6'                Reddish brown		1	12.5
		2	12.5
		3	12.0
		4	12.0
		5	11.5
		6	11.0
		7	11.0
		8	11.0
		9	11.0
		10	11.0



## LIMITATIONS OF LIABILITY

### WARRANTY

We warrant that the services performed by Nutting Engineers of Florida, Inc. are conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession in our area currently practicing under similar conditions at the time our services were performed. **No other warranties, expressed or implied, are made.** While the services of Nutting Engineers of Florida, Inc. are a valuable and integral part of the design and construction teams, we do not warrant, guarantee or insure the quality, completeness, or satisfactory performance of designs, construction plans, specifications we have not prepared, nor the ultimate performance of building site materials or assembly/construction.

### SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings; test pits are sometimes employed. The method of determining the boring location and the surface elevation at the boring is noted in the report. This information is represented in the soil boring logs and/or a drawing. The location and elevation of the borings should be considered accurate only to the degree inherent with the method used and may be approximate.

The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata as encountered and immediate depth to water data. The log represents conditions recorded specifically at the location where and when the boring was made. Site conditions may vary through time as will subsurface conditions. The boundaries between different soil strata as encountered are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling, nature and consistency of the respective strata. Substantial variation between soil borings may commonly exist in subsurface conditions. Water level readings are made at the time and under conditions stated on the boring logs. Water levels change with time, precipitation, canal level, local well drawdown and other factors. Water level data provided on soil boring logs shall not be relied upon for groundwater based design or construction considerations.

### LABORATORY AND FIELD TESTS

Tests are performed in *general* accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test boring report indicates the measurements and data developed at each specific test location.

### ANALYSIS AND RECOMMENDATIONS

The geotechnical report is prepared primarily to aid in the design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it shall not be utilized to determine the cost of construction nor to stand alone as a construction specification. Contractors shall verify subsurface conditions as may be appropriate prior to undertaking subsurface work.

Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations commonly exist between boring locations. Such variations may not become evident until construction. Test pits sometimes provide valuable supplemental information that derived from soil borings. If variations are then noted, the geotechnical engineer shall be contacted in writing immediately so that field conditions can be examined and recommendations revised if necessary.

The geotechnical report states our understanding as to the location, dimensions and structural features proposed for the site. **Any significant changes of the site improvements or site conditions must be communicated in writing to the geotechnical engineer immediately** so that the geotechnical analysis, conclusions, and recommendations can be reviewed and appropriately adjusted as necessary.

### CONSTRUCTION OBSERVATION

Construction observation and testing is an important element of geotechnical services. The geotechnical engineer's field representative (G.E.F.R.) is the "owner's representative" observing the work of the contractor, performing tests and reporting data from such tests and observations. **The geotechnical engineer's field representative does not direct the contractor's construction means, methods, operations or personnel.** The G.E.F.R. does not interfere with the relationship between the owner and the contractor and, except as an observer, does not become a substitute owner on site. The G.E.F.R. is responsible for his/her safety, but has no responsibility for the safety of other personnel at the site. The G.E.F.R. is an important member of a team whose responsibility is to observe and test the work being done and report to the owner whether that work is being carried out in general conformance with the plans and specifications. The enclosed report may be relied upon solely by the named client.

# SOIL AND ROCK CLASSIFICATION CRITERIA

## SAND/SILT

N-VALUE (bpf)	RELATIVE DENSITY
0 – 4	Very Loose
5 – 10	Loose
11 – 29	Medium
30 – 49	Dense
>50	Very dense
100	Refusal

## CLAY/SILTY CLAY

N-VALUE (bpf)	UNCONFINED COMP. STRENGTH (tsf)	CONSISTENCY
<2	<0.25	v. Soft
2 – 4	0.25 – 0.50	Soft
5 – 8	0.50 – 1.00	Medium
9 – 15	1.00 – 2.00	Stiff
16 – 30	2.00 – 4.00	v. Stiff
>30	>4.00	Hard

## ROCK

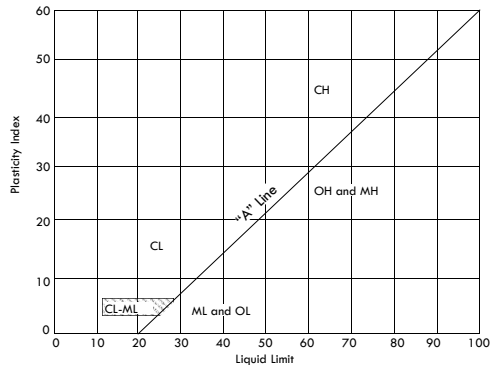
N-VALUE (bpf)	RELATIVE HARDNESS	ROCK CHARACTERISTICS
$N \geq 100$	Hard to v. hard	Local rock formations vary in hardness from soft to very hard within short vertical and horizontal distances and often contain vertical solution holes of 3 to 36 inch diameter to varying depths and horizontal solution features. Rock may be brittle to split spoon impact, but more resistant to excavation.
$25 \leq N \leq 100$	Medium hard to hard	
$5 \leq N \leq 25$	Soft to medium hard	

## PARTICLE SIZE

Boulder	>12 in.
Cobble	3 to 12 in.
Gravel	4.76 mm to 3 in.
Sand	0.074 mm to 4.76 mm
Silt	0.005 mm to 0.074 mm
Clay	<0.005 mm

## DESCRIPTION MODIFIERS

0 – 5%	Slight trace
6 – 10%	Trace
11 – 20%	Little
21 – 35%	Some
>35%	And

Major Divisions			Group Symbols	Typical names	Laboratory classification criteria		
Coarse-grained soils (More than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gavel, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3		
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW		
		Gravels with fines (Appreciable amount of fines)	GW*	d u	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are <i>borderline</i> cases requiring use of dual symbols.
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7		
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3		
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW		
		Sands with fines (Appreciable amount of fines)	SM*	d u	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are <i>borderline</i> cases requiring use of dual system.
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line with P.I. more than 7		
	Fine-grained soils (More than half of material is smaller than No. 200 sieve size)	Silts and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	<div>Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:  Less than five percent.....GW, GP, SW, SP More than 12 percent.....GW, GC, SW, SC 5 to 12 percent.....Borderline cases requiring dual systems**</div> 		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy, clays, silty clays, lean clays			
OL			Organic silts and organic silty clays of low plasticity				
Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts				
		CH	Inorganic clays or high plasticity, fat clays				
		OH	Organic clays of medium to high plasticity, organic silts				
Highly organic soils		PT	Peat and other highly organic soils				

DRC